
A MULTI-MODAL APPROACH to ECONOMIC DEVELOPMENT in the METROPOLITAN AREA TRANSPORTATION PLANNING PROCESS

White Paper

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Table of Contents

| | |
|--------------------------------------|-----------|
| Overview | 1 |
| Research Summary | 1 |
| Case Study Examples..... | 15 |
| Albuquerque Metropolitan Area | 15 |
| Chicago Metropolitan Area..... | 23 |
| Pittsburgh Metropolitan Area | 29 |
| Sacramento Metropolitan Area | 33 |
| Summary and Conclusions | 38 |

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Overview

This white paper provides a review of research and current practices of integrating economic development goals in metropolitan area transportation planning. Economic development, which is emerging as a priority topic in metropolitan area planning, addresses a fundamental societal goal of promoting growth in prosperity, economic opportunity, and the population's standard of living. The information presented in this paper is intended to serve as a technical resource for transportation planners, clarifying essential economic development concepts and how peer practitioners can address these concepts in the metropolitan area transportation planning process.

The first section of the paper summarizes research on essential economic development attributes and analytic methods drawn from a broad range of sources, including empirical and analytical research. This summary provides the context for the second phase of this study, which is a review of several selected best practice examples chosen to demonstrate how metropolitan planning organizations (MPOs) are successfully incorporating economic development goals in planning and decision-making.

Research Summary

The text in this section is organized to answer the major questions concerning determination of transportation-related economic development impacts and ramifications for the metropolitan area planning process. Section headings correspond to the principal themes emerging from the research performed in the first phase of the study, as follows:

- What are economic development benefits and how do they differ from broader categories of economic benefit? What are the best indicators of positive impacts on economic development – Gross Domestic Product (GDP), employment, or some other measure? How do transportation system improvements promote economic development?
- What kinds of transportation improvements are most effective in producing economic development?
- Is anticipated economic development a net gain or a shift between locations or industries?
- How do economic development benefits change over time and for different transportation systems? What measures can be applied to assess the extent of economic development and the return on transportation investments?
- How do different transportation modes affect economic development?
- What methods can be used to predict economic development? How can application of these methods serve the purpose of establishing investment priorities and future directions for the region?

- How does economic development relate to other goals of the metropolitan area planning process?
- How do planning agencies trade-off accomplishment of economic development against other goals? How can the planning process address economic development at key decision points?

Research findings responding to these questions are discussed below. Research included the review of the 2012 study, *Aligning Strategies to Maximize Impact: Case Studies on Transportation and Economic Development*, by the National Association of Development Organizations (NADO). The NADO report describes case studies of integrated transportation and economic development planning, illustrating how these efforts exemplify the seven principles of Standards of Excellence for Economic Development Districts designated by the U.S. Economic Development Administration. The current study complements the NADO study, by focusing on the role of the metropolitan area transportation planning process and the issues that MPOs address in long-range planning and the development of programs for transportation system improvements. Discussions with staff of NADO and the National Association of Regional Councils (NARC) have provided insights into aspects of economic development planning that are relevant to metropolitan area transportation planning, particularly in relation to organizational issues and identification of the best practice examples that the project team explored in the second phase of this study.

1. What is economic development?

Economic development consists of growth in economic activity or the standard of living.¹ Principal measures of economic development are GDP at the national scale, Gross Regional Product (GRP) or Gross State Product (GSP) at the scale of the region or at the state level, and jobs, income, and wealth. GDP is defined as the value of the output of all goods and services within a country. Distribution of economic development benefits, broadly understood in terms of the standard of living across all income categories, may be another important consideration related to economic development impacts.

Determining economic benefits

Economic benefits for roadway improvements commonly are calculated in terms of several factors:

- travel time savings;

¹ The Business Dictionary defines economic development as “progress in the economy. . .and general improvement in living standards.” <http://www.businessdictionary.com/definition/economic-development.html>

- reduced fuel and vehicle operating expenses, which can result from reduced traffic congestion;
- reduced number of accidents and the consequent savings in crash-related costs, including health impacts;
- expansion of capacity to increase VMT, allowing more people to travel by private motor vehicle and greater volumes of freight to move by truck.

Another perspective is to determine changes in overall mobility and *accessibility*, which relates to *person travel* across all modes, including transit, walking, and bicycling, as well as automobiles and other private vehicles. *Accessibility* (also called *access* or *convenience*) refers to “the ability to reach desired goods, services, activities, and destinations (together called *opportunities*)”² and may not directly involve movement or transportation. Transportation, however, most often has a major impact on accessibility. Factors contributing to accessibility include not only *mobility*, but also *mobility substitutes* (e.g., telecommunications), transportation system *connectivity* (i.e., the directness and quality of transportation connections), and land use, which affects proximity and the viability of alternative modes. Assessment of changes in accessibility – as well as consideration of balancing different planning goals (e.g. air quality, health) – requires additional measures beyond changes in VMT, roadway travel times and speeds, and accident frequencies, although these roadway-based measures are an important component of both mobility and accessibility across all modes.

Linking economic benefits to economic development

Economic benefits, which can be considered “user” or “consumer” benefits, are related to economic development if they result in changes in the “money flow” in the economy, usually due to substantially reduced production and distribution costs for businesses or increased wealth and asset values for people.

Following are the chief contributing factors to economic development:

- *Productivity* – output (i.e. goods and services) per unit of input (i.e. labor and other resources)
- *Transportation efficiency* – logistical improvements reducing costs, including monetary costs of production and distribution (vehicles, facilities, fuel) and labor costs through reduced travel times and scale efficiencies (e.g., increased vehicle loads, intermodal connections to ports).
- *Consumer expenditures* - reducing travel time for shopping trips *may* result in additional regional economic activity, although factors such as interregional

² Victoria Transport Policy Institute, *TDM Encyclopedia*, June 9, 2011.

- competition, location within a region, and competition from online retail may reduce benefits or even result in net adverse impacts, as discussed later in this section.
- *Income and wealth accumulation* – job growth, higher wages and salaries, and income from investments and asset appreciation may result from faster, more reliable transportation and improved access to work, shopping, services, and other resources.
 - *Land value* – building development, property values, and return on investment (ROI) to developers represent increased wealth and the value of land as an asset. Accrual of financial benefits to developers raises an important equity issue, however, in terms of the distribution of benefits versus costs for a public investment. When individual developers benefit from public expenditures on infrastructure, an important consideration is whether the investment produces commensurate public benefits, the most direct measures of which are increased net tax revenue and regional employment, beyond the immediate construction period.

2. How do transportation improvements affect economic development?

While economic benefits such as reduced travel time *can* stimulate economic development, there is no direct translation between economic benefits and new development because other factors such as labor, land and housing costs, taxes, regulatory environment, market characteristics, and resources (raw materials, workforce skills, land availability for manufacturing, warehousing, distribution facilities) are important independent variables. Most transportation improvements have a relatively small impact on total production costs. An example of a roadway infrastructure project with potential to generate substantial economic development would be a new or greatly improved connection to an industrial district, port, or airport, where traffic congestion or lack of access has been an impediment to growth.

Enhancing *reliability*, while difficult to quantify, can be an important factor in stimulating economic development, alleviating some of the risk associated with businesses' investment in capital facilities and reducing costs that can be incurred to compensate for supply chain obstacles.³ Although the most direct, tangible impacts generally derive from reduced production and logistics costs for businesses, improved travel times and expanded accessibility for commuters and students also may contribute to economic development under the right circumstances, as explained below:

- *Commuting to Work* – Substantial improvements in travel times for commuters and reduced fuel and vehicle maintenance costs due to reduced congestion may reduce the wages and salaries that businesses otherwise need to pay and attract qualified workers. (Lower salaries, however, would be reflected in reduced GRP. Corresponding reductions

³ *Linkages Between Infrastructure And Economic Growth*, Carolyn O'Fallon (2003), New Zealand Ministry of Economic Development www.med.govt.nz/templates/MultipageDocumentTOC___9187.aspx.

in labor cost then may result in increased investment in plant and equipment.) To the extent that reducing congestion results in more reliable arrivals of employees at work, businesses also may benefit from improved productivity. In the case of knowledge-based industries, creating a more attractive environment for a skilled and, in some cases, specialized, work force can increase the intellectual capital of the region. *Indirect* economic development impacts may result as businesses directly affected by lower commuting times grow and generate additional orders to their suppliers.⁴ Improving access to jobs for the unemployed, including the transit-dependent population, can increase employment.

- *Access to Educational Institutions* – Much as with workers, improved access may create a more attractive environment for students and increase enrollment at colleges and other educational institutions, thus boosting local economies.

Minor travel time reductions, however, even multiplied by large numbers of people, are likely to have negligible impacts on economic development, although total economic *user benefits* may be great. Generally, reductions in travel time through increased traffic speeds and reduced congestion, as well as improved access, are necessary but not sufficient conditions for transportation-related economic development. The Chicago Metropolitan Agency for Planning has estimated, using the Chicago Regional Economic Impact Model, that a \$2 billion investment in transportation infrastructure would result in \$2.2 billion in long-term economic output from nine different sectors of the economy, for a ratio of 1.1.⁵ These benefits are due in large part to efficiencies in commercial trucking and reductions in travel times. As discussed above, improved travel times can contribute to economic development but only to the extent that alleviating congestion actually lowers transportation costs, thereby increasing economic productivity and activity.

3. How do existing conditions affect the potential economic development impacts of investments in improved transportation?

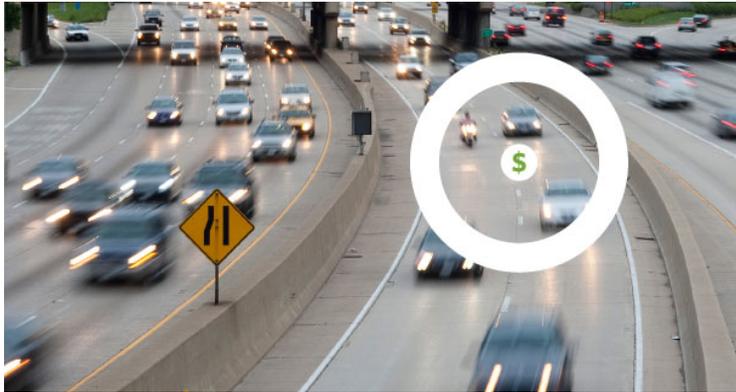
There is a marked difference between initial highway development and incremental capacity expansion or investment in improved operations. Mobility contributes to economic productivity, but *marginal benefits*, or incremental benefits resulting from investments in system improvements, decline beyond an optimal level, all other factors remaining constant.

Transportation systems in most parts of the US are mature, in the sense that the systems already are extensive, providing good quality access to most locations where there is human activity, and

⁴ *Economic Impact of Public Transportation Investment*, Glen Weisbrod, Economic Development Resource Group, and Arlee Reno, Cambridge Systematics, Inc., prepared for American Public Transportation Association, October 2009. http://www.apta.com/resources/reportsandpublications/Documents/economic_impact_of_public_transportation_investment.pdf

⁵ GO TO 2040 Strategy Report, <http://www.goto2040.org/infrastructure/2009>.

opportunities to improve both mobility and access substantially are much lower than in a developing country or earlier in the US at the time the Interstate Highway System was built.^{6,7} Highway expenditures now largely address maintenance and operations rather than capital expansion, resulting in diminished economic development impacts. Most highly productive investments in expanding highway capacity probably have already been made.



Cost of Reducing Highway Congestion
Source: Chicago Metropolitan Agency for Planning

Innovative management of highway operations, including road congestion pricing and application of Intelligent Transportation Systems, may be a cost-effective approach to boosting economic development, yielding

relatively high returns in terms of economic development *per dollar of expenditure*. Road congestion pricing also may be beneficial in that it may provide the opportunity for collecting user fees, such that the beneficiaries of an infrastructure improvement pay for a proportionate share of its cost. For example, if a highway improvement benefits a particular set of businesses, including freight carriers, electronic metering of their use of the improvement with mobile transponders could be used to assess fees to help pay for the cost of the improvement.

There have been major increases in the efficiency of freight operations in recent decades, resulting in productivity gains⁸. The potential for further increases in efficiency is unclear and rising fuel prices may offset cost savings from rising productivity. The impact of investments in freight transportation systems could increase, however, as fuel becomes more expensive and costs per mile rise; the value of proximity and optimizing distribution networks could increase, for example.

The impact of investments in alternative modes in this context can be difficult to isolate and depends on net improvements in both mobility and *accessibility*, which in turn depend on ridership for transit projects and the usage level for pedestrian and bicycle improvements. *Access*, which refers to the ability of a population to travel to desired destinations – where employment, personal services, shopping, and recreational resources are located, is an inherently

⁶ Standing Advisory Committee on Truck Road Transport, *Transport and the Economy: Summary Report*, pp.3,4.

⁷ Federal Highway Administration, Freight Management and Operations website, http://ops.fhwa.dot.gov/freight/freight_analysis/improve_econ/index.htm

⁸ Federal Highway Administration, *Freight Transportation, Improvements in the Economy*, Appendix B *Transportation Infrastructure, Freight Services Sector and Economic Growth, A Synopsis*, T.R. Lakshmanan, William P. Anderson, Center for Transportation Studies, Boston University, January 2002. http://ops.fhwa.dot.gov/freight/freight_analysis/improve_econ/appb.htm#sector

multimodal concept. An example of an *accessibility* measure is the average time required to travel to designated key destinations, across all modes. *Mobility*, which is a related but broader concept, can be measured in various ways, such as the speed and amount of travel by vehicle (e.g., VMT), but does not *necessarily* reflect the travel needs of population groups with low rates of vehicle ownership or the ability to travel within urban areas, where the use of alternative modes is more practical for many people than driving.

Expansion of passenger transit service areas can support economic development if the result is a substantial improvement in accessibility for workers or, in some cases, customers of businesses in the areas served. Moreover, the degree of *net* growth in the use of alternative modes depends on the extent to which travel is genuinely incremental versus a shift away from other locations or automobiles. Finally, as noted previously, the net improvement in mobility or access must be of sufficient magnitude to materially lower business production and distribution costs, stimulate new forms of business, or create additional commercial activity. Impacts are likely to be greatest in areas that experience high levels of congestion on a regular basis and where other conditions, e.g. low labor costs, workforce skills, proximity to markets, favor economic growth.

4. Net economic development versus transfers of benefits

An important consideration is whether a transportation investment produces *net* economic development versus a *transfer* of economic activity, which can occur spatially or between industries or population groups. Transfers can be:

- *Inter-regional* – improved transportation can cause businesses to re-locate from one region to another. From the perspective of the region gaining economic development, this is a net gain, but from a broader national perspective, the gain may be negligible or absent. Generally, *net* economic development benefits decrease as the spatial area considered expands, because gains in one area frequently come at the expense of another, to varying degrees.
- *Intra-regional* – shifts from one location to another within a region may be neutral, beneficial, or even negative. If development shifts to an area targeted for economic growth, the impact may be considered positive even if there is no net growth for the metropolitan area. When retail commerce shifts to new locations (in malls or strip development at the fringe of metropolitan areas) to benefit from travel time savings, central city and local shopping districts suffer a loss of business.
- *Shifts between industries or sectors* – new transportation facilities may promote development of new industries but reduce activity in others, such as agriculture. While overall GRP may rise, jobs in a particular industry may decline, with the possible result

of undermining other regional goals, such as promoting “green jobs” and local agriculture.

- *The level and share of household expenditures exported outside the region* – and the US. Purchases of vehicles, fuel, and products manufactured elsewhere may affect regional and national GDP. The proportion of local personal expenditures on vehicle operations – or imported products of various types – may increase along with VMT growth, resulting in job and income loss, even if GRP (e.g., from fuel purchases) increases⁹.

Even when economic development represents a total or partial transfer between industries or locations, rather than a net increase in economic development, the impact may be beneficial when serving specific economic objectives, such as:

- Improving access to an area with undeveloped economic potential, including economically depressed areas;
- Stimulating industries with growth potential, such as a fledgling biotech industry.

Timeframe of impacts

The timeframe during which impacts on economic development are measured can result in vastly different results.

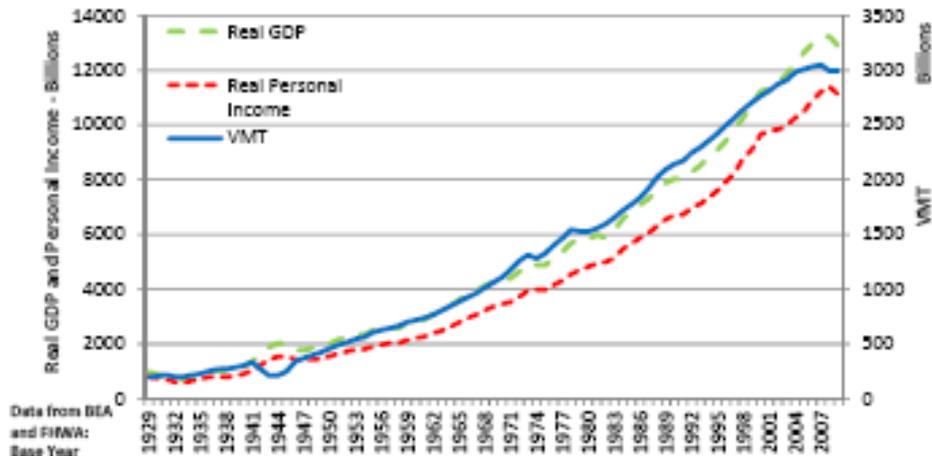
Reduced traffic congestion can result in positive impacts on economic development, for reasons cited previously, as can improved accessibility to jobs and schools. A 2009 study examining the impact of traffic congestion on employment growth in large U.S. metropolitan areas found that congestion reduces employment growth, particularly over the long run in highly congested places, and suggests that in a large congested city such as Los Angeles, a 10% increase in congestion would reduce subsequent long-run employment growth by 4%.¹⁰

Economic development often is correlated with growth in VMT, made possible by highway expansion, particularly in areas that do not have high-quality access. A common goal of metropolitan planning organizations, however, is reducing VMT, for purposes of reducing traffic congestion, protecting the environment, reducing energy consumption, and accomplishing other societal goals, including increased physical activity from shifts to walking or bicycling. VMT and GDP growth in the U.S track closely to one another, as illustrated in the graph below from a recent study by the Oregon Transportation Research and Education Consortium (OTREC), based

⁹ Littman, Todd, Victoria Transport Policy Institute, *Evaluating Transportation Economic Development Impacts*, August 2010, p.52.

¹⁰ *Does Traffic Congestion Reduce Employment Growth?* <http://www.universityofcalifornia.edu/news/article/19372>

on data from FHWA and the Bureau of Economic Analysis.¹¹ This and other studies report a strong correlation between VMT and GDP.



Source: *The Relationship Between VMT and Economic Activity*, Oregon Transportation Educational and Research Consortium.

The timeframe (short or long-term) in which the most pronounced economic development occurs as a result of highway capacity expansion can vary, for several reasons:

- (1) In the immediate short-term timeframe, construction-related jobs and contractor profits add to GRP, although when viewed from a broad national perspective, or to the extent project funding is from the State or local municipalities, this funding has opportunity costs and to some extent is drawn from the private sector economy. Net economic development depends on the level of consumer demand in the private economy, which may be international in scope in a globalized economic system. From a regional perspective, however, Federal funding is largely a net benefit in economic development. The U.S. Federal Highway Administration has estimated that, on average, each \$1 billion of Federal-Aid highway capital expenditure supported 27,000 jobs in 2007.¹²
- (2) In some cases, reducing transportation costs may act as a disincentive to modernization or restructuring of industries necessary to compete on a long-term basis. For example, transportation improvements benefitting a specific plant location may delay changes that would create potential economies of scale or efficiencies resulting from consolidating or re-locating operations in more modern facilities, dispersing operations to multiple locations, or investing in equipment that would allow shifting modes (e.g., from long-haul truck to rail or the reverse).

¹¹ *The Relationship Between VMT and Economic Activity*, Oregon Transportation Research and Educational Consortium, November 2011, p.4. <http://otrec.us/project/417>

¹² *Employment Impacts of Highway Infrastructure Spending*, Federal Highway Administration website, <http://www.fhwa.dot.gov/policy/otps/pubs/impacts/index.htm>

- (3) Long-term impacts on development patterns, resulting in more dispersed land use patterns, may lower productivity gains. Highway capacity expansion or even more efficient operations may result in the phenomenon of induced demand or VMT increase on a long-term basis, reducing the viability of public transit and other alternative modes and potentially increasing emissions. There is some evidence that labor productivity declines with population dispersion in metropolitan areas, as a higher proportion of residents live outside urban centers, and increases with polycentric (i.e., multiple concentrated business districts, cities and towns) development that is transit-supportive.¹³ Hence, the need for planning transportation system investments within a broader multi-modal context that takes into account land use.

There also is evidence that compact development patterns promoting access by transit and walking can increase productivity by reducing some transportation costs and the costs of public services and infrastructure, increasing ROI to investors as a result of higher-density land



Gold Street in Downtown Albuquerque

Photo Appears Courtesy of MRCOG

supportive.

development used to its best and highest value, and increasing sales and property tax receipts. Preservation of land for uses critical to the economy, such as freight facilities, may also produce long-term net economic development benefits.

Productivity increases result from the clustering of land uses (i.e., “spatial agglomeration”), which allows more face-to-face contact and access to specialized labor¹⁴. A recent research study concludes that the spatial agglomeration impacts of transit could equal \$1.5 million to \$1.8 billion annually, depending on city size.¹⁵ Thus, investments in transit systems can promote transit-supportive development that results in growth in GRP, jobs, and wealth.¹⁶ Conversely, access by alternative modes can decline if VMT growth rises in concert with decentralization of development in dispersed land use patterns that are not transit-

¹³ Evert J. Meijers and Martijn J. Burger (2009), *Urban Spatial Structure and Labor Productivity in U.S.*

Metropolitan presented at the 2009 Regional Studies Association annual conference, ‘Understanding and Shaping Regions: Spatial, Social and Economic Futures,’ Leuven, Belgium, April 6-8, 2009

www.regional-studies-assoc.ac.uk/events/2009/apr-leuven/papers/Meijers.pdf.

¹⁴ *Economic Impact of Public Transportation Investment*, Weisbrod and Reno, October 2009.

¹⁵ *Public Transit Is Worth Way More to a City Than You Might Think*, Atlantic Monthly magazine, August 14, 2013, reporting on research by Daniel Chatman, University of California, and Robert Noland, Rutgers University, to be published in *Urban Studies*.

¹⁶ *Smart Growth and Economic Success: Benefits for Real Estate Developers, Investors, Businesses, and Local Governments*, U.S. Environmental Protection Agency, Office of Sustainable Communities, Smart Growth Program

Trip purpose

The return on transportation investments in economic development generally is greatest for *freight, services, and business travel*.¹⁷ Freight transport supports economic activity and has high marginal costs (the average marginal operating cost of truck freight is about \$60 per hour¹⁸), so reductions in travel time translate into relatively high increases in efficiency and productivity. Thus, truck lanes, port and airport improvements, improved port and airport access, and efficient road pricing that gives preferential treatment to higher-value trips (freight, service vehicles, business travel) are likely to produce the greatest returns in economic development. It is possible, however, that lower freight transportation costs can be disadvantageous to local businesses, as imported goods become cheaper relative to products produced locally.

An important equity consideration in targeting transportation investments to particular businesses and industries is “who pays?” Should the general public bear the costs for an expenditure that will disproportionately benefit a few, particularly when the beneficiaries are not economically disadvantaged? Are there viable strategies for funding transportation system improvements through user fees under these circumstances? This issue is of lesser concern if the distribution of benefits – through travel time reductions, for example, or possibly through increases in tax revenues due to greater business activity and employment – is more diffuse throughout the population.

Commuting travel has lower impacts on economic productivity and the potential economic development impacts are, therefore, lower. Personal trips, including shopping and personal errand trips, have even less impact on productivity and development, due to the greater role of the characteristics, quality, and cost of purchases, as well as internet shopping. As general mobility increases, the proportion serving highly productive travel (freight, business, and commuting trips) usually declines and a higher percentage of VMT is consumer or recreational travel, both of which have less impact on productivity¹⁹. *Access* by alternative modes often declines to the extent that increasing mobility through VMT growth results in more dispersed land use, as noted previously.

Measuring economic development

Economic development benefits of varying degree can be claimed for most transportation improvements, since the immediate anticipated benefit of these projects typically is faster, more

¹⁷ Littman, Todd. *Evaluating Transportation Economic Development Impacts*, Victoria Transport Policy Institute, August 2010, p.18.

¹⁸ American Transportation Research Institute, *An Analysis of the Operational Costs of Trucking:2011 Update* http://www.atrri-online.org/research/results/Op_Costs_2011_Update_one_page_summary.pdf

¹⁹ Littman, Todd, *Evaluating Transportation Economic Development Impacts*, Victoria Transport Policy Institute, August 2010, P.21.

reliable, and safer travel conditions, which in turn promote economic activity. Sound analytical justification for improvements is essential, however, to provide a basis for comparing and establishing priorities for alternative investments, at both the regional and national levels. Economic development impacts can be expressed in terms of both *economic development per dollar* and *net economic development*. From the longer term perspective of the metropolitan transportation plan, the capability to assess differences in economic development for alternative policies and strategies is crucial in considering the future direction of the region.

Economic benefits of transportation projects are most readily measured in terms of the monetary value of reduced congestion, lower vehicle operations and maintenance cost, and increased safety, as reflected in lower travel times, higher speeds, and fewer accidents, based on the results of travel forecasting models. Forecasting economic *development* benefits, independent of short-range construction-related impacts, is more complicated and requires specialized econometric models (TranSight, RIMS II, IMPLAN, REMI, and LEAP) that can translate transportation access improvements and related investments into growth in GRP, employment and income.

A basic component of these models is *input-output tables*, which predict the ways in which changes in expenditures affect the flow of dollars or economic activity in a particular geographic area or industry, calculating changes in employment, profits, and tax revenues. Integrated transportation economic evaluation models take into account the effects on input-output of personal and freight travel time and cost, reliability, logistics efficiencies, congestion, and ground access to intermodal terminals for different modes, quantifying cost savings, productivity, employment, incomes, and business growth.

These models are highly data intensive and complex, and their use requires a high level of technical knowledge, financial resources, and data. Most of the models are proprietary and are licensed to users. In addition, spatial data generally are lacking to analyze impacts at the local level, although regional level applications are feasible, while not yet common. Most applications of the models to date have been for large-scale highway projects.

The question of access, as distinct from mobility, adds to the complexity of predicting economic development impacts. Improvements in *access*, which may in turn affect economic development, may vary by mode. In particular, public transit, pedestrian, and bicycle modes provide access in areas of concentrated, high-density development where highways cannot operate efficiently. Accessibility is thus inherently related to both land use and mode, and generally is more difficult to measure than mobility, typically measured in terms of VMT. Accessibility can produce a broad range of economic as well as other benefits addressing regional goals, such as access to jobs, education, or social services for low income and other populations without access to automobiles.

Alternative approaches, which likely will be less reliable and precise than econometric models, may combine quantitative data from travel forecasting models with consideration of qualitative

factors, such as the quality of existing transportation access, the severity of existing bottlenecks, trip purposes, and likely impacts on development patterns. Integration of the analysis of potential improvements within a broader planning context that addresses land use, safety, the environment, the location of economically depressed areas, and equity can help to produce more realistic assessments of potential economic development impacts.

Transportation planning context

The metropolitan area planning process is well-suited to address the trade-offs between economic development and other key goals, as well as major ramifications for legal requirements such as environmental justice. Growth in economic development generally is a key objective of metropolitan area transportation planning. Progress toward this goal can be defined purely in terms of the dollar value of output, such as GRP, and employment, income, and competitiveness (relative to other metropolitan areas). Equity, or the distribution of economic benefits by income level, community, and location within the metropolitan area, is another crucial indicator of economic success that can account for impacts on economically disadvantaged individuals and neighborhoods, which may be a focus of economic development planning and analysis undertaken for environmental justice and Title VI. “Do low-income people or other disadvantaged populations benefit?” is a question inherent to economic development.

An accurate representation of economic development impacts should reflect critical *externalities*, which account for adverse impacts on the environment, public services and infrastructure, property values, safety, and health that impose real economic costs.²⁰ For example, these costs often take the form of environmental damages to different industries, as when water pollution from manufacturing harms agriculture and tourism. Moreover, social costs, in terms of community livability, affordability, air, noise, water quality, public health, and greenhouse gas emissions, may offset some of the benefits of economic development, although these effects may be difficult to quantify.

The assessment of trade-offs between economic development and other major goals can inform several key “decision points” in the process related to the establishment of priorities, specifically development of a long-range vision and policies in the metropolitan transportation plan (MTP) and project selection for the Transportation Improvement Program (TIP). The emerging role of performance-based planning provides opportunities for more robust evaluation of economic development impacts, as encouraged in MAP-21. Performance measures that capture the impacts of alternative investments and policies in terms of key criteria can provide an objective basis for assessing trade-offs between economic development and other planning goals in conjunction with MTP and TIP development.

²⁰ MPOs can use the World Health Organization’s Health Economic Assessment Tool (HEAT) model to assess the economic benefits from physical activity of mode shifts to walking and cycling.

A Comprehensive Economic Development Strategy (CEDS) is required by the US Department of Commerce's Economic Development Administration as a condition for receiving yearly planning funds. Development of the CEDS for metropolitan areas underscores the need for sound analytic approaches as well as coordination with the metropolitan area planning process. MPOs may want to develop or strengthen partnerships with economic development districts participating in NADO and the US Department of Commerce-supported planning process, to secure the benefits of a coordinated approach that optimizes complementary resources and capabilities.

Case Study Examples

Following is a brief review of several selected best practice examples illustrating how MPOs across the nation are meeting the challenges associated with planning for economic development. The research team selected the examples on the basis of their demonstrated innovation and effective practice in addressing economic development goals through the metropolitan area transportation planning process. Discussions with the NADO and NARC have informed the selection of the case study examples, which represent a wide geographic cross-section and metropolitan areas varying widely in terms of population and geographic area.

The case study examples are from MPOs responsible for the following metropolitan areas:

- Albuquerque
- Chicago
- Pittsburgh
- Sacramento

Albuquerque Metropolitan Area

Economic development is a key priority in the planning process for the Albuquerque metropolitan area. The Mid-Region Council of Governments (MRCOG) is the MPO for the region (MRMPO) and the U.S.

Department of Commerce/Economic

Development Administration-designated Economic Development District (EDD), with responsibility for the four-county region's CEDS. Additional elements of MRCOG's economic development program are shown below.



- **Plan for regional economic development planning**—MRCOG works in partnership with Regional Economic Development Associations and the Metro NM Development Alliance to bring together the communities in the four-county region of Bernalillo, Sandoval, Tarrant and Valencia Counties to identify strengths, develop implementation plans for growing sectors, and solve issues of common concern.
- **Assist organizations and entities seeking grants from the Economic Development Administration**—as a designated Economic Development District, the MRCOG helps to bring Federal investment funding to the region.
- **Support rural communities**—help communities and local governments with planning and support services, infrastructure assessment and planning, grant funding and advocacy.
- **Partner with public and private entities in job development**—to market the region, support recruitment efforts, promote regionalism and connect employers with job training opportunities.
- **Support the local agriculture economy, small farms & local food**—provide monthly meetings on relevant local food topics, provide on-line resources including maps, land linkages and data, host an annual local food festival, weekly blogs, and other media.
- **Provide data**—MRCOG houses free, downloadable data including Census data, forecast data, road, transportation, population, land use, travel characteristics, employment, education, industrial resources, local history, climate, tax incentives, and other data useful for economic development.
- **Provide economic development modeling**—MRCOG staff use a regional economic model (Regional Economic Model, Inc. or REMI) to document and forecast changes in the local and regional economy.
- **Support efforts to market the region**—through www.nmsitesearch.com.

MRCOG’s joint responsibilities as both the MPO and EDD for the Albuquerque region allow close coordination of transportation and economic development planning. The primary nexus is identification of transportation infrastructure improvements needed to support growth in the strategic economic focus areas (for example, science and technology, health services, and aviation/aerospace), as designated in the CEDS.

Linking Economic Development Performance Targets in the MTP and TIP

The MTP identifies economic development as a major goal, which is carried forward to project selection for the TIP, based on a systematic evaluation conducted through MRMP’s *Planning Priority Process (PPP)*. The PPP links major goals in the region’s *2035 Metropolitan Transportation Plan (MTP)* to development of the TIP. The PPP is a quantitative evaluation process used to score projects based on the extent to which they address regional needs, as reflected in specific goals, corresponding objectives, and evaluation criteria. The MPO decided on this approach in response to its committees’ recommendation that a more objective project evaluation method was needed than the previous approach, which relied on subjective assessments by member agencies as to whether projects met the seven goals of the 2030 MTP²¹.

The PPP is based on the three goals for the 2035 MTP:

²¹ *Project Prioritization Process Guidebook for the Albuquerque Metropolitan Area*, September 2012, p.9. http://www.mrcog-nm.gov/images/stories/pdf/transportation/tip/PPP/PPP_Guidebook_09-2012FW.pdf



Photo courtesy of MRCOG

performance measures, which form the basis of the PPP. The objective of Goal 3, *Support Economic Activity and Growth*, is:

- (1) Preserve and improve regional quality of life
- (2) Mobility of people and goods
- (3) Support economic activity and growth

Economic development – Goal 3 – has a maximum total point score of 20, compared to the total point score of 65 for the three goals combined, and thus has a major influence on the selection of projects for the TIP and the metropolitan planning process more generally.

A series of objectives define each of the three goals more specifically. These objectives are linked to criteria and

To develop a transportation system that promotes economic activity and vitality in the region, achieved through decisions that provide an affordable, efficient, and safe multimodal transportation network.

The 2035 MTP established three performance targets for measuring progress toward the goal of *Economic Activity and Growth Performance*:

- (1) Investment Areas; *Target transportation investments that improve connectivity and mobility for all modes within high Activity Density Areas.*
- (2) Local Priorities and Land Use: *Increase transit services and appropriate thoroughfare connections to locally-designated Activity Centers and rail station areas.*

This target reflects the quality of roadways and other modes serving Activity Centers identified in the Albuquerque Bernalillo County Comprehensive Plans, rail station area plans, and other city centers in the region.

- (3) Housing and Transportation Affordability: *Reduce the average household combined cost of housing and transportation compared to costs in 2010.*

Total housing and transportation costs for districts within a metropolitan area typically are inversely related, as housing prices per square foot rise in higher density areas, while travel distances (and associated costs) for work and other activities decline. Consideration of combined housing and transportation costs, therefore, provides a revealing indicator of affordability, which

is a measure of equity, in terms of the distribution of economic well-being. Housing and transportation costs also are factors affecting an area's growth potential.

MRMPO applies three *criteria* in the PPP to score candidate projects in terms of the goal, *Support Economic Activity and Growth*, and its associated objective, as described above:

- High Activity Areas
- Private Sector
- Local Priorities



Boarding Albuquerque Rail Runner *Source: MRCOG*

The performance measures corresponding to each of the three criteria are:

- Serve areas with high population and employment activity (Investment Areas);
 - Measure current and future activity density (base, interim, horizon years)²²;
 - Measure growth in activity density.
- Support private sector enterprise
 - Encourage private sector involvement in projects/programs;
 - Facilitate movement of freight.
- Support local priorities
 - Ensure projects/programs are consistent with adopted jurisdictional land use plans;
 - Provide incentives for projects/programs.

²² MRCOG calculates activity density by combining population and jobs per acre, while weighing employment by the ratio of people-to-jobs, approximately 2-to-1, generally consistent with trip generation logic that each job generates more activity than each resident.

Performance measures are both quantitative and qualitative. Qualitative measures address the question of whether a project adheres to or achieves an objective set forth in a criterion; they often are rated on a “yes/no” basis and are worth a maximum of 3 points, versus 0 points if the project does not meet the objective. Quantitative measures, however, reflect the extent to which a project meets scoring thresholds for the criterion. A key advantage of the “activity density” measure, which is a component of the “high activity areas” criterion, is that planners can compare it across jurisdictions. MRCOG has different scoring thresholds for activity density in small urban and rural areas versus the large Albuquerque Urbanized Area.

As applied to the *Support Economic Activity and Growth* goal, the following criteria and thresholds determine project PPP scores.

1. High Activity Areas (Maximum Point Value=10 Points)

Purpose: Serve areas with high population and employment density.

A. Current Activity Density (Maximum Point Value=4 Points)

Figures below measure base year employment and population density (calculated on a per acre basis), weighted towards employment.

| Activity Measure | Points |
|------------------|--------|
| 0 - 4.99 | 0 |
| 5 - 9.99 | 1 |
| 10 - 14.99 | 2 |
| 15 - 19.99 | 3 |
| 20 + | 4 |

B. Future Activity Density 2035 (Maximum Point Value=4 Points)

| Activity Measure | Points |
|------------------|--------|
| 0 - 6.99 | 0 |
| 7 - 11.99 | 1 |
| 12 - 17.99 | 2 |
| 18 - 24.99 | 3 |
| 25 + | 4 |

C. Activity Density Growth Rate 2008 – 2035 (Maximum Point Value=2 Points)

| Activity Measure | Points |
|------------------|--------|
| 0 - 99.99% | 0 |
| 100 - 199.99% | 1 |
| 200% + | 2 |

2. Private Sector – Freight (Maximum Point Value=3 Points)

Purpose: Give priority to projects in areas with high levels of freight activity. The criterion consists of two measures:

A. Project Purpose and B. Project Location. Both are *qualitative*, yes/no measures.

A. Project intended to address freight movement. Examples of freight projects: dedicated lanes; transfer/distribution center; regional freight plans; logistical improvements – 2 Points

B. Project serves freight corridor-1 Point

3. Local Priorities-(Maximum Point Value=7 Points)

Purpose: Encourage continuity between regional planning and the project development process, rewarding projects that result from a local planning process and respond to identified needs.

A. Local Funding- Local match exceeds required minimum funding match – 4 Points

B. Land Use Conformity – Project conforms to existing land use plans – 3 Points

MRCOG is building its capacity to apply economic modeling as a technical tool in the project evaluation process, using TranSight, an extension of REMI that integrates future travel demand information with its economic impact model. MRCOG has evaluated the economic impacts of the New Mexico RailRunner Express and the Paseo Del Norte/I-25 Interchange Reconstruction Project. TranSight measures transportation network improvements in terms of transportation cost savings, increased access to labor, and lower business costs due to improved accessibility to goods and services. While the integration of TranSight into the MRMPO toolbox is in its early phases, MRMPO expects that it will be effective in quantitatively demonstrating the economic

impacts of transportation projects across municipal and county lines, informing policy makers about the cost effectiveness of different transportation investments, and measuring the economic impacts of the construction phases of building or upgrading transportation facilities.

Key Concepts

The example of the Albuquerque metropolitan planning process illustrates a number of important features of the application of economic development concepts discussed in the first section of this paper:

- (1) **Focusing on specific *locations*** where transportation improvements have the greatest potential to produce economic growth. Targeting *High Activity Areas* addresses economic development in terms of several factors:
 - increasing business activity through “spatial agglomeration,”²³ i.e., face to face contact;
 - increasing the value of land and returns on investment by developers;
 - in many cases, promoting economic development that will produce jobs and raise incomes among low-income and economically disadvantaged population groups.
- (2) **Rating freight projects as high priority.** The PPP takes into account the critical role of freight movement in economic development. Crucially, the movement of goods is a transportation function with system impacts at the local, regional and national levels. Combining the criterion of freight-supportive functional attributes with the freight corridor location factor should help to distinguish projects that will result in tangible benefits for freight movement from others that have less potential to bolster economic activity.
- (3) **Application of objective criteria and associated performance measures.** While the relationship between economic development and transportation system characteristics is complex, MRCOG has developed a process for *comparing the expected economic development benefits of potential transportation investments* that is straightforward, transparent, and has practical requirements for data that commonly are generated through the planning process.
- (4) **Systematic integration of economic development in the transportation planning process.** Crucial to this purpose is the linking of economic development as a primary goal in the MTP and TIP, with the PPP serving to interpret the MTP vision into specific, measurable criteria. Another important aspect of integrating economic development and

²³ Defined in the first section of this paper, p.10.

transportation planning is the coordination that occurs within MRCOG between the MPO and the planning activities of the EDD.

Chicago Metropolitan Area

The Chicago Metropolitan Agency for Planning (CMAP), which is the regional planning agency and the MPO for the



Chicago Metropolitan
Agency for Planning

Chicago metropolitan area, approaches economic development within a broad context that addresses the need for transportation system improvements in conjunction with related workforce and business environment characteristics contributing to “economic innovation.” Another important feature of the metropolitan planning process is an emphasis on performance-based evaluation of capital investments, with economic development being one of the principal criteria used to assess project benefits. The region also has an ambitious public-private freight initiative, with a program of capital improvements coordinated with the metropolitan planning process.

Linking Transportation Planning and Economic Development Strategy

CMAP considers transportation-related elements of economic development in the context of a broader strategy that encompasses workforce development and other contributing factors to a dynamic economy. As a regional planning agency, CMAP’s responsibilities include economic development, land use policy, open space, and other quality of life factors for its seven member counties. CMAP has identified a set of recommended implementation actions that the public sector can take to help create conditions favorable to economic growth.²⁴ These actions, identified below, complement transportation system investments and address some of the key factors, as identified in the first section of this paper, that determine whether improved mobility and accessibility will meet intended economic development objectives:

- **Improve data and information systems** to track the results of programs in terms of indicators, such as business openings/closings, jobs, and technology transfers, that reflect economic development goals and objectives.
- **Nurture the region’s industry clusters** through targeted investment decisions. *Clusters are interdependent firms that share common resources and technologies and depend on a similar labor pool and institutions.*²⁵ CMAP identifies the examples of freight/logistics, advanced manufacturing, and biotechnology as industry clusters of particular

²⁴ *GO TO 2040*, Comprehensive Regional Plan, p. . <http://www.cmap.illinois.gov/2040/support-economic-innovation>, p.189-190.

²⁵ *GO TO 2040*, Ibid, p. 184.

importance to the region's economy. The recommended range of investments for the region to consider includes financial incentives and seed funding, as well as transportation infrastructure.

- **Increase the commercialization of research.** This recommendation relates to communications and information sharing among research institutions and businesses that can translate research into marketable products within the region. Actions include building information networks connecting researchers, entrepreneurs, and venture capitalists.
- **Support a culture of innovation.** A specific form of support that public agencies can provide is the reform of regulations that create barriers to innovation.

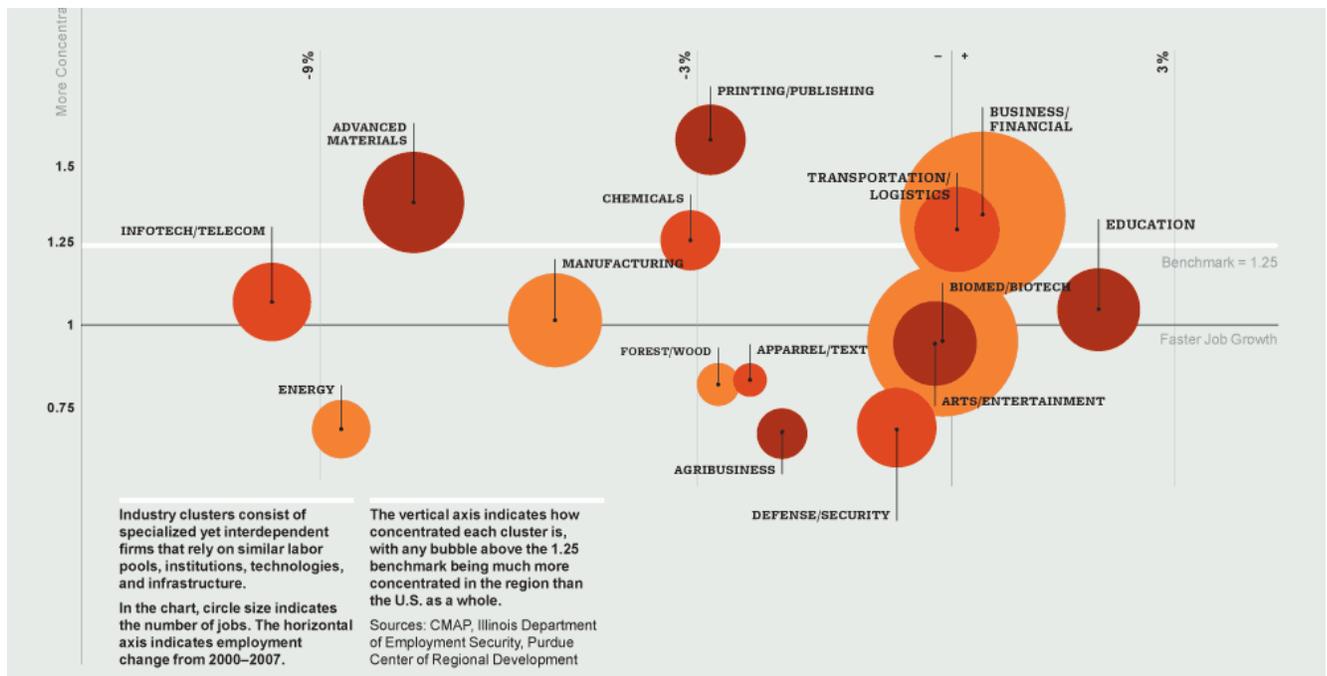


Figure courtesy of CMAP

CMAP's work on economic development also has included evaluation of existing Federal, State, and local financial incentives for potential application in Chicago, such as targeted tax incentives for firms most likely to contribute to the region's economic innovation; alternative financing of beneficial land use patterns; employer training investment; Enterprise Zone credits; a large business development program; and corporate headquarters relocation.²⁶

²⁶ Memorandum, *Economic Development Incentives*, 2009.

CMAP has suggested indicators that will provide objective information for assessing the success of these initiatives:

- Employment in research and development: increase employment in the “knowledge economy,” which generally offers high-paying jobs;
- Venture capital funding: reverse the decreasing trend experienced since 2000; suggested target of achieving parity with the Boston metropolitan area.

Evaluation of Transportation System Capital Investments

Chicago regional decision makers, residents, and other stakeholders collaborated to meet the challenge of planning for sustainable long-range prosperity in the comprehensive regional plan, *GO TO 2040*, a central goal of which is to “enhance the region’s economic vitality and global competitiveness.”²⁷

CMAP developed evaluation measures and indicators for economic development and other categories of transportation benefit with the assistance of the Volpe Center,²⁸ for application in developing *GO TO 2040*. The indicators comprise both quantitative and qualitative information. In some cases CMAP combined the indicators with the results of detailed project-specific studies to assess long-term economic development impacts. CMAP applied the indicators both in the process of identifying individual high-priority capital projects and also in evaluating the collective impacts of all selected high-priority projects combined²⁹.

Long-Term Economic Development, Including Freight System (jobs, income, and output) is one of 16 “Evaluation Measures” used to review potential capital projects included in the MTP for Chicago, *GO TO 2040*. This composite measure or criterion comprises seven “indicators” intended to capture different attributes contributing to economic growth:

- Income
- Workforce
- Business Environment
- Other Economic Competitiveness
- Social Health Factors
- Development Potential and Location
- Transportation System Reliability

²⁷ *GO TO 2040*, Chicago Metropolitan Agency for Planning, Executive Summary.

²⁸ Memorandum, *Major Transportation Capital Project Evaluation Measures*, Chicago Metropolitan Agency for Planning, June 2009. <http://www.cmap.illinois.gov/documents/20583/152b4125-5f57-49e3-ab35-306f768efe0b>

²⁹ Ibid.

Another measure, *Jobs-Housing Access*, measuring the *number of jobs within specified travel times for auto and transit*, was applied only for districts defined as “environmental justice” areas, which have a concentration of low-income or minority residents. The purpose of including this measure was to ensure that the economic benefits of transportation investments are distributed equitably, taking into account the needs of the entire population, including low-income neighborhoods and economically disadvantaged groups.

Freight

Improving the efficiency of freight movement in Chicago, the nation’s historical railroad center, is critical to CMAP’s economic development strategy. CMAP conducted a regional freight system study in 2009, including all four modes of freight transportation – truck, air, water, and



rail – to identify infrastructure and operational strategies that could improve the efficiency and interconnectedness of the region’s freight network. The study included extensive participation by stakeholders, including businesses that ship materials and products, as well as local officials.

Chicago Freight Rail Yard Source: *GO TO 2040*, CMAP

CMAP supports the Chicago Regional Environmental and Transportation Efficiency (CREATE) program, the product of a public-private partnership of the U.S. Department of Transportation, State of Illinois, City of Chicago, Metra (the agency responsible for the regional commuter rail system), Amtrak, and the freight railroads. CREATE consists of strategic improvements to the freight rail system that will reduce freight bottlenecks, raise operating speeds, and reduce the impact of freight operations to local neighborhoods by reducing grade-crossing delays and freight engine emissions. *GO TO 2040* identifies completion of all 71 CREATE improvement projects as a goal. Projects consist of:

- 25 new roadway overpasses or underpasses at location where auto and pedestrian traffic cross rail track at grade level
- 6 new rail overpasses or underpasses to separate passenger and freight train tracks
- viaduct improvements
- grade crossing safety enhancements
- upgrades of tracks, switches and signal systems.

GO TO 2040 also addresses trucking on the region's roadways and recommends expansion of the designated regional truck network.

CMAP supports consideration of establishing a self-financed Regional Freight Authority to address institutional and funding barriers to providing the full range of needed regional freight network improvements. This Authority could have the capability to finance freight system capital improvements and also to address freight-related policy issues, such as traffic delays, grade crossings, safety, and noise. The recommended process for creating this type of Authority involves convening freight stakeholders and implementing agencies to explore potential roles and responsibilities as well as funding options that would draw on both public and private sector sources. CMAP has assembled a task force to explore Authority-related issues.

Another potential function of the Authority could be to assemble data that can be used for performance-based planning for the freight system, much as the previously discussed evaluation measures are for other categories of capital investments. Data for individual private sector businesses in the freight industry often are proprietary, complicating the effort to construct useful evaluation measures for freight operations; it may be possible to constitute the Authority so as to alleviate concerns about the disclosure of proprietary information,³⁰

Key Concepts

- (1) **Coordination of investments in transportation, workforce development, and growth industries.** The research summary in the first section of this paper discussed the importance of factors not related directly to transportation that have a major impact on economic development: labor, land and housing costs; workforce characteristics; land availability; regulations; and resources. CMAP has studied these factors and developed recommendations to identify and support promising sectors of the regional economy, complementing investments in mobility and access.
- (2) **Performance-based planning.** CMAP assessed all candidate capital improvement projects considered for its comprehensive regional plan in terms of their impacts on economic development, using an objective evaluation measure composed of seven constituent indicators. Additional economic development indicators correspond to job and business creation initiatives. The transportation planning process in Chicago increasingly is guided by setting priorities and measuring results to achieve planned outcomes.
- (3) **Freight emphasis.** The CREATE freight network improvement is a collaborative public-private partnership with a strategic plan for addressing critical freight railroad needs.

³⁰ *GO TO 2040*, Chicago Metropolitan Agency for Planning, p.317.

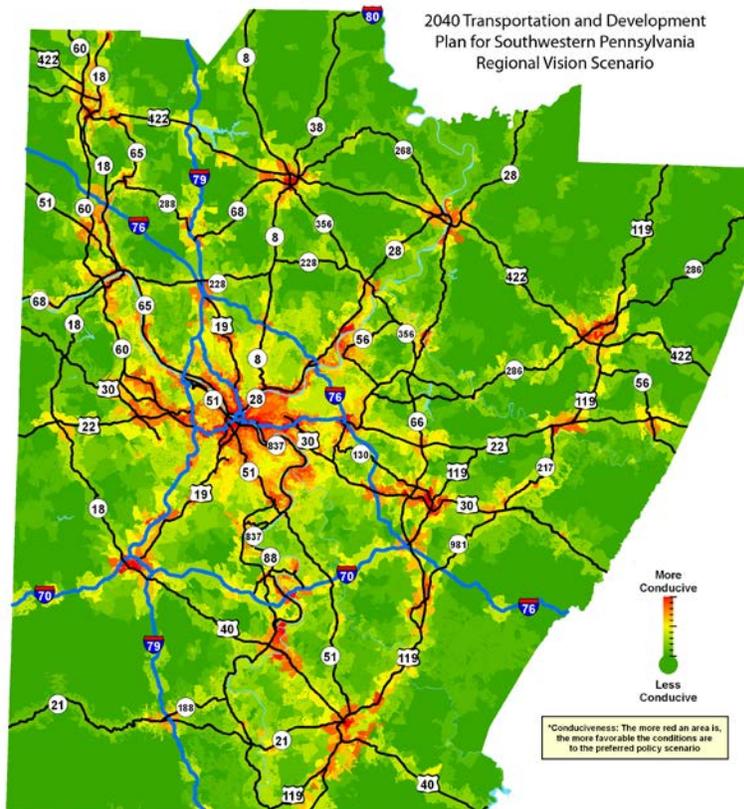
CMAP coordinates with this initiative and is incorporating the CREATE program in its broader freight transportation plan, which addresses goods movement by truck as well as by rail. This example illustrates the importance of strategic freight planning in relation to economic development, in that the planning process identifies the most critical needs, which the region can address on a systematic basis. Cooperation with private industry is essential to strategic planning for freight transportation.

Pittsburgh Metropolitan Area

The Southwestern Pennsylvania Commission (SPC) is both the MPO for the Pittsburgh metropolitan area and a Local Development District (LDD), as designated by the Appalachian

Regional Commission (ARC), and is an Economic Development District (EDD) funded by the U.S. Department of Commerce, Economic Development Administration (EDA) to support community and economic development planning. Through its ARC designation, SPC is responsible for carrying out the EDA's Enterprise Development Program (EDP), designed to assist small and medium-sized businesses in the Pittsburgh region. As an EDD, SPC is responsible for economic development planning and project development for EDA funding consideration. The dual areas of responsibility have helped SPC to integrate development of the Comprehensive Economic Development Strategy (CEDS), an EDP requirement, with the MTP, developed in the agency's capacity as the Pittsburgh MPO. The MPO serves 10 counties, seven of which are in the Pittsburgh urbanized area. The Pittsburgh

area example illustrates the integration of transportation and economic development planning, specifically in terms of the metropolitan transportation planning and CEDS development process.



Map courtesy of SPC

Commonwealth of Pennsylvania provided the funding for the early phases of LUTED planning, no state funding was allocated for project implementation. The Pennsylvania Department of Conservation and Natural Resources (DCNR), Department of Community and Economic

State-Level Coordination

Pennsylvania's 2002 Land Use, Transportation and Economic Development (LUTED) initiative was conducted to improve the coordination of planning among government agencies. LUTED's scope extended from transportation and land use integration to relevant natural resource, energy, and agricultural concerns. While the

Development (DCED), and PennDOT designated funds for regional planning agencies to develop *Regional Action Strategies* linking land use, transportation, and economic development through the LUTED process.

In 2005, LUTED funding partially supported SPC in initiating the *Project Region* visioning process, which directly involved over 3,000 participants. The visioning process involved consideration of multiple scenarios, with evaluation criteria ranging from land use (e.g. development density, transit access) to traffic and other transportation conditions, and infrastructure cost. As part of this process, SPC conducted a *Regional Town Meeting*, in which a public meeting was hosted at its headquarters and held simultaneously at 10 satellite locations where participants throughout the region interacted over the web and engaged in the joint evaluation of alternatives. The resulting regional vision, documented in the *2035 Transportation and Development Plan for Southwestern Pennsylvania*, which is the MTP for the Pittsburgh metropolitan area, combined results of the metropolitan transportation planning process, the CEDS, and the *Regional Action Strategy* produced through the LUTED process.

SPC and other EDDs are incorporating their LUTED plans into their CEDS and are pursuing EDA funding for projects that are consistent with LUTED visions. The Pennsylvania DCED coordinates funding for multiple agencies for priority projects, such as those identified through LUTED.

Coordination of the MTP and CEDS

Projects must demonstrate consistency with one or more of the major policies identified in the *2035 Transportation and Development Plan* to be included in the CEDS. Policy objectives include:

- Redevelopment of existing communities;
- Coordination of infrastructure investment to optimize benefits;
- Emphasis on business development, giving priority to existing business retention and expansion;
- Focus on industrial development, particularly brownfields;
- Workforce development;
- Support for strategic industry clusters;
- Support for colleges, universities, and young adults;
- Promotion of tourism and hospitality industries oriented to historical, cultural, recreational, and ecological assets;
- Preservation and development of agriculture.

These objectives, which are carried forward in the *2040 Transportation and Development Plan*, guide SPC's development and selection of projects for the TIP and CEDS.

The 2040 Plan describes illustrative economic development projects, including several that consist in part or whole of transportation improvements:

- Environmental remediation and infrastructure development at a 90-acre site close to the City of Pittsburgh will include a National Historical Park and a fly-over ramp over existing railroad tracks.
- Redevelopment of a 7.5-mile former steel plant site, with access to rail and the Ohio River.
- Construction of a five-street grid connecting a district in Pittsburgh to the Central Business District, in the process creating development parcels.
- Development of an airport business park to take advantage of general aviation services.

All of these projects emphasize land use development, with transportation benefits or access an ancillary objective varying in degree of importance. In some cases, the relationship to transportation consists of pre-existing transportation access, requiring little or no required transportation investment. Several projects included in the 2035 and 2040 Plans involve redevelopment of sites with high-quality airport access.

A riverfront park project provides connections between a convention center and both nonmotorized trails and a docking facility for waterfront transportation, illustrating how improvements in walking, bicycling, and waterborne transportation facilities can contribute to growth in tourism and the hospitality industry. Projects included in the Plans also demonstrate an emphasis on land use in terms of the redevelopment of economically distressed districts and revitalization of the region's existing communities. As a group, the set of projects selected for their economic development potential reveals a strategic linkage with transportation access.

The 2040 Plan identifies the energy sector in the Pittsburgh region as a "strategic industry cluster." SPC is active in planning for this cluster, in partnership with businesses, industry associations, and elected officials, although water and sewer projects, not only transportation, have been a priority for infrastructure investment supporting this industry.

Funding for most of the economic development projects supported by SPC comes from a range of sources. As noted in the MTP, there are approximately 105 state and Federal programs that can potentially provide funding for economic development projects. Most of these projects are not specifically transportation-related. Typical funding sources from June 2007 to April 2011 were the Appalachian Regional Commission, the EDA, and the Commonwealth of Pennsylvania's Redevelopment Assistance Capital Program (RACP).

Key Concepts

- (1) **Integrating transportation and economic development planning.** SPC serves the dual role of MPO and EDD for the Pittsburgh region and is able to integrate rigorous economic development planning for the CEDS with the metropolitan planning process. The MTP reflects this close alignment between economic development strategies and transportation.
- (2) **Participation in the state-level LUTED planning process provided an exceptional level of interagency collaboration in planning** for sustainable land use and development, including a crucial transportation component. The participation of state agencies helped them to gain a better understanding of funding needs. The planning process also benefitted from a strong foundation in grassroots participation.
- (3) **Projects grounded in strategic economic policies.** Economic development policies reflect clear priorities based on a careful analysis and understanding of needs at a broad regional level and in localities across the region. Setting clear priorities to optimize the benefits of investments, in both transportation infrastructure and other economic development projects, is one of these policies. SPC's plans and investment priorities reflect knowledge of the potential benefits and limitations of transportation improvements to effect economic growth. Transportation investments are targeted to situations where mobility or access is a constraining factor on economic activity. In many cases, projects involve relatively modest investments in site improvements that take advantage of existing transportation access, which may include access by alternative modes, including walking and bicycling.

Sacramento Metropolitan Area



The planning process for the Sacramento, California metropolitan area illustrates the synergy resulting from integrating economic development, transportation, and land use planning. In this rapidly growing metropolitan area, traffic congestion represents a serious threat to the future economy. Population is forecast to grow by over 870,000 by 2035, compared to the 2008 population of 2,309,968, an increase of 38 percent.

While traffic congestion is a concern relative to economic growth in most places, substantial expansion of highway capacity to accommodate growth is not feasible in established metropolitan areas generally and in the Sacramento region, specifically. Expansion of the area's highway and system, built largely during the 1950s and 1960s, would be difficult because urban growth since has surrounded the roadway network, curtailing options for building the region's way out of traffic congestion. The transportation challenges arising from these circumstances pose a potential barrier to all aspects of economic activity, as well as the quality of life for everyone who lives and works in the region.

Over a decade ago, regional leaders launched the *Blueprint Project* to develop viable alternative solutions to the challenges associated with metropolitan area growth in a region with a mature highway system. The culmination of this effort is a long-range vision for growth that promotes compact, mixed-use development and more transportation choices. The Board of Directors of the Sacramento Area Council of Governments (SACOG), which is the MPO for the metropolitan area, adopted a *Preferred Blueprint* in 2004. Land use is key to the strategy for optimizing mobility and access for both businesses and employees in the *Blueprint* Vision, providing an essential foundation for continuing economic development.

Identifying Regional Economic Needs

SACOG's plans for supporting the regional economy rest on a strong technical foundation, providing the basis for identifying strategies to meet the need for improvements in transportation infrastructure, services and policies. Active participation in the planning process by area businesses and freight carriers complements technical information to provide planners with a thorough understanding of needs specific to the economy of the Sacramento region.

The analysis of transportation conditions in the Sacramento region builds on rigorous analysis and modeling of the regional economy. The Center for Continuing Study of the California Economy (CCSCE) develops the growth projections for SACOG, including projections of future employment by major employment sector, population, and household growth at the regional

scale. The CCSCE projects future employment based on forecasts of U.S. and California job increases and the competitive position of the Sacramento region to capture a share of this growth. The CCSCE has forecast that job growth in California statewide and in the Sacramento region will outpace the nationwide rate of increase over the next two decades, following a slowdown that occurred in 2005-2010, due to a variety of factors.

The Metropolitan Transportation Plan & Sustainable Communities Strategy (MTP/SCS) reports that:

*The region's economic base is currently dominated by two sectors: 1) federal and state government, including state colleges, and 2) professional, business and information services, which include computer services, architectural and engineering services, management and consulting services and management of companies.*³¹

SACOG also seeks to diversify the economy, expanding the range of employment opportunities. Several industry sectors – construction, professional and business services, and educational and health services – are relatively fast-growing and will account for an increasing percentage of future jobs, as the relative importance of manufacturing and retail trade decreases. Agriculture has long been an important sector of the regional economy, although the relative share of the economy for this industry has declined as urban and suburban development has flourished. The MPO's Rural-Urban Connections Strategy (RUCS) project is investigating strategies to



Photo courtesy of SACOG

promote more rural economic growth and to enhance the region's agricultural industry, energy production, and environmental services.

SACOG gives careful consideration to the spatial distribution of expected growth in economic activity and jobs, as well as in residential population. The availability of detailed, technically sound forecasts of future activity by industry sector provides the information necessary for analyzing future economic development patterns. For purposes of developing the MTP/SCS, SACOG identifies areas within the region with development capacity to house all socioeconomic segments of the population. Considered in its totality, the planning process illustrates sophisticated application of the fundamental technical tools of transportation planning to provide

³¹ Sacramento Council of Governments, Metropolitan Transportation Plan/Sustainable Communities Strategies, p.215. <http://www.sacog.org/2035/files/MTP-SCS/MTPSCS%20WEB.pdf>

a better understanding of location, mobility, and accessibility needs related to economic development.

Land Use Solutions

Land use planning, following the *Blueprint Vision*, is a crucial element of SACOG’s strategy for meeting transportation needs related to economic development. Recognizing the practical limits on highway capacity expansion as a solution to potential increases in congestion, the Sacramento region looks to more efficient distribution of land use to accomplish these purposes:

- Reduce the travel distances between points of origin and destination, both for people and freight;
- Expand opportunities for travelers to use transit and other alternative modes;
- Preserve the availability of land for facilities and infrastructure crucial to business and industry.

The last of these purposes, which is most directly related to economic development, also reflects a specific focus on freight and goods movement.

The Blueprint vision fosters compact development with mixed land use and “a better balance of jobs and housing” within local communities. New jobs and services will be located near existing homes or job centers to develop land use patterns conducive to using transit and other alternative modes, including walking and bicycling, thus providing greater returns or benefits from transportation system investments. The MTP/SCS focuses regional development in Transit Priority Areas, located within a half-mile of existing and planned light rail and commuter rail



Photo courtesy of SACOG

stations, streetcar/tram corridors, and bus and bus rapid transit (BRT) routes. As a result, employee commutes should be shorter on average, reducing capacity demands on the roadway network. Higher densities also will increase the viability of public transportation as an alternative to driving, because access distances by walking, bicycling, and feeder bus will decrease. The projected net result is that the effective capacity of the transportation system to accommodate population *and* economic growth will increase, without widespread expansion of physical roadway capacity.

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In addition to the broad strategy of accommodating growth through more efficient land use, SACOG gives specific consideration to the interrelationships among land use, transportation, and the needs of the economy. One notable aspect of the technical analysis oriented to economic development is forecasting how many jobs will be filled by local residents versus residents from other locations. These forecasts indicate which transportation modes are viable for employees to use for travel to and from work, as well as the capacity required to accommodate employee travel by mode.

Another important feature of SACOG's land use planning, from the standpoint of economic development, is a focus on spatial requirements for business and freight operations. SACOG tracks growth trends for industries dependent on major freight facilities and infrastructure, as a basis for developing strategies for estimating their spatial needs and those for business, freight, and agricultural facility location. It also is SACOG's policy to "inform local governments and businesses about a regional strategy for siting industry and warehousing with good freight access."³²

Distinguishing local from regional and interregional freight movement, SACOG identifies and works to preserve land to meet goods movement needs of local customers, while also considering the locational and land capacity requirements of suppliers, distributors, and other businesses operating at a larger scale that may be regional or may extend to a broader mega-region, the nation or across national borders. An important consideration for businesses serving a wide geographic market is whether a location close to the downtown area or other urban centers is critical. SACOG notes that many suppliers, distributors, and other businesses serving regional or broader geographic markets prefer to be near the center of the region because of its good freeway access, although they do not necessarily need high-cost center-city sites, which better serve office and retail land uses.

Freight Infrastructure

SACOG recognizes the critical importance of freight to the region's economy and has identified goods movement routes, including national highways approved for trucking; state and local terminal access routes; routes identified in county general plans or other planning documents, and key rural routes serving farm-to-market travel that have been identified through community outreach. Designating the freight network helps to focus investments in improvements and maintenance activities on the roads that carry heavy and frequent truck traffic and to limit freight traffic on local roads and friction with neighborhoods. Accommodating goods movement on the designated network is a priority consideration for expanding inter-regional highway capacity, which occurs only on a limited and highly selective basis.

³² Sacramento Council of Governments, Metropolitan Transportation Plan/Sustainable Communities Strategy

SACOG also is coordinating with adjacent regional transportation planning agencies to reduce obstacles to more effective truck routing over a broader geographic area. The MPO's *Regional Goods Movement Study* and RUCS project address rail, port, air cargo, and pipelines, as well as trucking.

Key Concepts

- (1) Developing a strong technical foundation in analysis and modeling of the regional economy.** State of the art analytic capability and detailed data allow for planning at a level of detail sufficient to relate economic activity to location-specific needs for mobility and access.

- (2) Integrating economic development, transportation, and land use planning.** In metropolitan areas where traffic congestion on area roadways poses a constraint on economic growth and there are severe spatial constraints limiting the expansion of roadway capacity, creation of more-efficient land use patterns can help to preserve or improve mobility and accessibility. Fostering compact, mixed-use development may reduce average travel distances for employees and businesses, while public transit options become more attractive for commuters and other travelers. As a result of easing the demand for travel by automobile and other personal vehicles, more capacity is available for trips that have a greater positive impact on economic development, such as freight movement and business travel.

- (3) Focus on freight.** Understanding the needs of industry for goods movement and identifying freight corridors is an important element of planning for economic development. Infrastructure improvements in designated freight corridors may merit priority consideration in the project selection process. Two particularly important and distinctive features of freight planning exemplified by the Sacramento example are:
 - Preserving land availability in critical locations for business and freight facilities, including warehousing;
 - Distinguishing local-serving goods movement from long-distance freight operations serving large geographic markets; assessing the locational needs of freight and manufacturing facilities to determine the need for sites close to growing job centers versus regional highway access in areas with less density.

Summary and Conclusions

The findings below present a synthesis of the first two sections of this paper. The concepts explored in the first section of the paper clarify the relationship between economic development and transportation planning, including the attributes of transportation system investments that stimulate economic activity. The case study examples discussed in the second section of the paper highlight the innovative approaches of several MPOs in addressing the concepts introduced in the first section of the paper. Conclusions summarizing the lessons for effective metropolitan transportation planning practice are as follows:

- **Integration of transportation and economic development planning is essential to unravel the complex interrelationships between transportation and the economy.** The first section of this paper discussed a range of challenges associated with predicting the impacts of potential transportation system investments on economic development, including variability related to existing mobility and access, location, and trip purposes. Transportation system improvements result in economic growth when they contribute to greater *productivity*, not simply when mobility or accessibility increases, which may be desired for other reasons. Thus, transportation system investments aimed at supporting economic development should be strategic and targeted to locations, modes, and purposes where mobility or access is a substantial constraining factor on existing or potential economic activity.

Labor, land, and housing costs, natural resources, workforce attributes, market characteristics, the local regulatory environment, and tax policies are dominant economic considerations in many situations and the potential impacts of better transportation conditions may be secondary to these factors. Understanding specific needs and benefits of transportation improvements within this broader context is essential to establish investment priorities. In some cases, effective practice will consist of channeling investments in other types of infrastructure, financial incentives for growth industries, or workforce development to take advantage of high-quality transportation access that currently exists. The example of SPC in Pittsburgh illustrates how strategic, cost-effective investments in industrial site improvements take advantage of existing transportation access.

- **Coordination of institutional responsibilities for economic development and transportation planning can increase the potential for successful economic development.** Two of the case study MPOs – MRMPO in Albuquerque and SPC in Pittsburgh – also are the US EDA-designated Economic Development Districts (EDD) for their metropolitan areas, allowing for close coordination of transportation planning, including the MTP and TIP, with development of the CEDS. In the case of the Chicago

metropolitan area, CMAP has regional planning responsibilities for economic development and land use planning, in addition to transportation. For MPOs with a purview focused on transportation planning, collaborative partnerships with economic development agencies – and ideally, with private sector businesses in the region – can be crucial to effective integration of transportation and economic development strategies.

- **Effective integration of economic development goals in metropolitan area transportation planning requires a sound technical foundation.** Transportation system improvements will not necessarily produce economic development, even when they have the effect of reducing congestion or increasing accessibility, for reasons discussed in the first section of the paper and summarized above. Even in the context of a comprehensive economic plan or development proposal, investments in transportation infrastructure may not produce the desired results. Specialized econometric models, which incorporate input-output tables accounting for the flow of dollars in the economy, generate quantitative estimates of economic development impacts and may be the tool of choice for the analysis of large-scale transportation infrastructure projects or programs consisting of multiple projects.

The case studies presented in this paper provide examples of other technical approaches that may complement use of the models, provide a “reality check” on model-generated forecasts, or provide an alternative that may be appropriate in many situations, particularly when smaller-scale improvements are under consideration. The Sacramento area case study, in particular, illustrates the importance of high quality data, which allows analysis of mobility and access conditions related to economic development at a detailed neighborhood- and industry-specific level.

- **Land use, transportation, and economic development are integrally related.** Several of the case studies underscore the importance of the spatial dimension of economic development in terms of *location*. MRMPO in the Albuquerque area gives priority to *High Activity Areas* for transportation system investments, illustrating the importance of location. The Sacramento area planning process emphasizes the relevance of compact land use patterns to economic development. Potential benefits of promoting higher-density, transit-oriented development as an element of economic development strategy include:
 - Increased land value and return on investment by real estate developers;
 - More face-to-face contact, i.e. spatial “agglomeration,” which may help to incubate growth in business activity, particularly in innovative, knowledge-based industries;

- Improved employment opportunities and higher incomes for low-income and economically disadvantaged population groups who are disproportionately transit-dependent and concentrated in urban neighborhoods; and
 - Shifting a greater share of person trips to alternative modes and reducing travel distances between many trip origins and destinations, freeing capacity on area roadways for truck trips vital to business operations.
- **Freight transportation is a priority consideration in economic development planning.** All four case studies emphasize the importance of freight. Identification of rail and truck freight corridors is a critical step in planning for goods movement. The case studies illustrate additional aspects of freight planning practice relevant to economic development:
 - Participation in the planning process by private industry, including businesses based in the region and freight carriers, to identify needs, to provide information for forecasting growth, much of which typically is proprietary, and to reach consensus on policies and investments;
 - Preserving land availability in critical locations for business and freight facilities, including warehousing;
 - Assessing the locational needs of freight and manufacturing facilities to determine requirements for sites close to growing job centers versus regional highway access in areas with less density.

An important related consideration raised in the first section of this paper is the economic equity of public investments in infrastructure that may directly benefit the few – in this case, businesses, “industry clusters,” and/or freight operators – that experience productivity gains from improvements in the freight transportation network. In assessing the economic development benefits of prospective expenditures focusing on freight, evaluation criteria can address the level of public benefits that can be expected, in terms of increased tax revenues and tangible improvements in measures of economic growth, such as changes in GRP and employment.

- **Performance-based planning can be effective in distinguishing transportation improvements with the greatest potential to promote economic development.** Both Albuquerque and Chicago metropolitan areas illustrate elements of performance-based planning in addressing economic development goals. Albuquerque’s Planning Priority Process (PPP) is an objective evaluation process in which the MPO scores projects on the basis of criteria derived from specific goals in the MTP. Economic development accounts for a potential 20 points out of a maximum 65-point project score, and thus is a major consideration in project selection. Activity density, freight, and land use planning are project scoring factors for economic development. In establishing this process and

identifying these specific factors, MRMPO has navigated through the complexities of the transportation – economic development connection to develop a practical, transparent, and data-driven approach to comparing candidate transportation projects in terms of their economic development potential. The PPP interprets the goal of economic development in the MTP into measurable criteria for project selection in the TIP.

CMAP in the Chicago area also has a process for evaluating capital projects in terms of economic development potential based on objective indicators. In addition, CMAP has identified objective, quantifiable indicators – changes in the number of jobs in a targeted industry cluster and levels of venture capital funding – to measure the demonstrated post-implementation outcomes of its economic development initiatives. Both the PPP in Albuquerque and the capital project evaluation process in the Chicago metropolitan area use objective measurement to compare project benefits and to assess trade-offs between economic growth and other goals, such as environmental protection. The formulation of goals, objectives, strategies, and policies in the MTP and the selection of projects with the assistance of these evaluation processes represent key decision points for economic development planning.

- **Distribution of Economic Development Benefits:** Growth in GRP is a primary measure of economic development. Employment and income are related, useful economic development measures portraying important aspects of the standard of living in a metropolitan area. Equity or economic justice, representing the impacts of policies and investments on economically disadvantaged segments of a region’s population, is also a crucial consideration related to economic development. The goal of stimulating economic development is particularly critical with respect to impacts on those with low incomes. Data on growth in jobs and income, which are available at a more disaggregated level than GRP, can help to measure distribution impacts on neighborhoods and economic subgroups within the broader population, as well as to measure the overall impact of plans, policies, and investments. CMAP includes income and growth in employment in the “knowledge economy” as evaluation measures.

As noted above, equity considerations also apply in the case of particular private sector businesses that may benefit from improvements to the freight network. In these cases, the distribution of benefits is an important issue. Planners can evaluate the feasibility of strategies for assessing user charges to freight operators and other businesses, such as land developers, who benefit from public sector transportation investments.

Ultimately, the standard of living in a metropolitan area is a product of both economic conditions and other quality of life variables, such as health, air and water quality, access to natural and cultural resources, sustainability, and safety. This latter set of variables, however, is not a component of economic development. The metropolitan area

transportation planning process provides the ability to compare the net impacts of policies and projects on economic development and to evaluate possible trade-offs with respect to other goals that capture quality of life attributes. Performance-based planning tools can play an important part in this process, providing measures that serve as a basis for objective assessment of the trade-offs resulting from alternative policies and investment decisions.

Suggested Research Topics

The above findings identify elements of effective practice that may be relevant for MPOs and their planning partners working on improved approaches to economic development planning. The following are suggestions for further development of this research that could contribute to better integration of economic development and transportation planning:

- Lessons from private sector delivery systems for public sector freight planning;
- Ramifications (advantages and disadvantages) for Megaregions, States and at a nationwide scale;
- Improvement in coordination with the US Department of Commerce/EDA economic development programs – identification of needs for information sharing and joint decisionmaking;
- Focus on performance management applied to economic development and integration with decisionmaking through the transportation planning process, including the emerging emphasis on performance-based planning;
- Role of the private sector in collaborative economic development planning, including funding, and equity considerations in relation to the distribution of benefits – should specific industries and businesses benefit from public sector investments and how can these private sector enterprises contribute to paying a commensurate share of associated costs?
- Strategic land use planning to optimize economic development benefits of transportation system investments.



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